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PATENT
Docket No. SJO920000065US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Vladimir Nikitin et al.	)
Serial No.:	10/087,332	)
Filed:	March 1, 2002	) Group Art
For:	**REDUCTION OF INTERFERENCE PICKUP IN HEADS FOR MAGNETIC RECORDING BY MINIMIZING PARASITIC CAPACITANCE**	) Unit: 2652
Examiner:	Davis, Donald D.	)

APPELLANTS' APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The USPTO received Appellants' timely Appeal Brief on February 22, 2005 and Notice of Appeal on June 25, 2004. The Notice of Appeal was filed in response to the Final Office Action mailed March 24, 2004. In response to the Appeal Brief, the Examiner reopened prosecution and issued a Final Office Action mailed May 18, 2005. The Final Office Action included a new ground of rejection, but was not necessitated by an amendment or based on an information disclosure statement. Based on the Final Office Action and the Examiner's reliance on 37 C.F.R. §1.193(b)(2), Appellants considered the reopened prosecution and Final Office

Action a written statement in answer to Appellant's brief (an Examiner's answer) under 37 C.F.R. §1.193(b)(2) and 37 C.F.R. §41.39. Therefore, Appellant filed a supplemental appeal brief in compliance with 37 CFR 41.39(b)(2) on June 30, 2005. Appellants contended that reopening prosecution is an unnecessary waste of time and money, and that making the first action final based on a new ground of rejection is improper. New grounds of rejection are addressed below in Section 7 as set forth in 37 C.F.R. §41.37(c)(1)(vii). Appellants reiterated all of the applicable arguments presented in Appellants Appeal Brief of February 22, 2005.

In response to a status request filed March 23, 2006, Appellants received a notice of non-compliant appeal brief because the supplemental appeal brief was inadvertently filed without a signature and because the new rule changes required filing of a new appeal brief and new notice of appeal. Consequently, Appellants are filing this new appeal brief with an accompanying notice of appeal. Appellants note that the filing fees have changed since the appeal was first filed. Appellants are paying a fee of $500 for the appeal brief fee and $500 for the notice of appeal fee. However, since Appelants have already paid $330 for the appeal brief fee and $330 for the notice of appeal fee, Appellants request that Deposit Account No. 09-0466 be credited $340 ($170 difference for the appeal fee plus $170 difference for the notice of appeal fee). The Commissioner is hereby authorized to charge payment of any additional fees associated with this communication, or to credit any overpayment, to Deposit Account No. 09-0466.

1. REAL PARTY IN INTEREST

The real party in interest is the assignee, International Business Machines Corporation, Armonk, New York.

2. RELATED APPEALS AND INTERFERENCES

Other than the Appeal Brief filed February 22, 2005, there are no related appeals or interferences.

3. STATUS OF CLAIMS

The Final Office Action mailed March 24, 2004 rejected Claims 1-25 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,807,073 to Takeura et al. (hereinafter

"Takeura") in view of U.S. Patent No. 5,048,175 to Jurisch et al. (hereinafter "Jurisch"). Given that the Examiner failed to cite Takeura and Jurisch in the new Final Office Action mailed May 18, 2005, Appellants consider these rejections withdrawn. Nevertheless, to the extent that the Examiner might argue that these rejections are still relevant, Appellants maintain and incorporate by reference the arguments presented in the Appellant's Appeal Brief of February 22, 2005.

The new Final Office Action mailed May 18, 2005 issued a new ground of rejection in response to the Appeal Brief filed on February 22, 2005. The new Final Office Action rejected Claims 1-3, 5-7, 14, 16, and 23-25 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,966,800 to Huai et al. (hereinafter "Huai") and also rejected Claims 4, 8-13, 15, and 17-22 under 35 U.S.C. § 103(a) as obvious in view of Huai.

4. STATUS OF AMENDMENTS

Appellants filed an amendment subsequent to receipt of the final rejection mailed March 24, 2004. The amendment was entered for purposes of this appeal, as noted in the Advisory Action mailed June 16, 2004. A copy of the claims is included in Section 9, Claims Appendix.

In the Appeal Brief received by the USPTO February 22, 2005, Appellants proposed an amendment to claim 15 to replace "~~Further comprising an~~ electrical contact ~~having~~" with "wherein the electrical contact pad has." This amendment was proposed to address readability of the preamble and antecedent basis agreement with Claim 1, but was apparently not entered. However, since this proposed amendment is now not permitted under 37 C.F.R. 41.39(b)(2) or 37 C.F.R. 41.37(c), Appellants have removed the proposed amendment and request that the informality relating to antecedent basis be addressed once Claim 15 is allowed.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Magnetoresistive (MR) and giant magnetoresistive (GMR) heads used in data storage drives may be subject to interference noise. This noise may reduce the quality of the data read from a tape storage device or a hard disk drive. As the interference noise increases, the signal-to-noise ratio (SNR) decreases and the quality of the detected read signal decreases. *See*, Background, pages 1-2. The interference noise may be due, at least in part, to ambient radio frequency (RF) energy, which may originate from external (e.g., radio and/or television station

broadcasts) or internal (e.g., storage drive motors and/or electronics) sources. Summary, page 4, lines 7-15. Various embodiment disclosed in the present application reduce the effects of interference noise by reducing the capacitance of various head elements within a storage drive. Summary, page 4, lines 16-19.

One embodiment includes a magnetic head 600 having a material 602, which has a low dielectric constant, interposed between a substrate 614 and an electrical contact pad 610. The electrical contact pads 610 are the read and write elements through which a storage drive reads and writes data to/from the storage device. The low dielectric material 602 reduces the parasitic capacitive coupling between the substrate 614 and the contact pad 610, thereby improving the quality of the signal at the contact pad 610. Detailed Description, page 10, line 26 through page 11, line 12. In particular, independent Claim 1 recites an electrical contact pad, a substrate, an insulating undercoat, and a low dielectric material. The electrical contact pad 610 (See Fig. 6, Specification page 10, lines 5-8) represents one example of the electrical contact pad recited in Claim 1. The substrate 614 (See Fig. 6, Specification page 10, lines 9-13) represents one example of the substrate recited in Claim 1. The insulating undercoat 608 (See Fig. 6, Specification page 10, lines 15-25) represents one example of the insulating undercoat recited in Claim 1. The low dielectric material 602 (See Fig. 6, Specification page 10, line 26- page 11, line 8) represents one example of the low dielectric material recited in Claim 1.

The following quotation of Claim 1 includes reference numerals and parenthetical references to representative examples of the elements and components recited in Claim 1 in compliance with 37 CFR 41.37(c)(1)(v).

1. A magnetic head (See Fig. 6, element 600, Specification page 10, lines 1-2) comprising:

an electrical contact pad (See Fig. 6, element 610, Specification page 10, lines 5-9);

a substrate (See Fig. 6, element 614, Specification page 10, lines 15-19) on which the magnetic head (See Fig. 6, element 600, Specification page 10, lines 1-2) is formed;

an insulating undercoat (See Fig. 6, element 608, Specification page 10, lines 23-25) interposed between the pad and the substrate; and

a material (See Fig. 6, element 602, Specification page 10, line 26- page 11, line 8) selected to have a low dielectric constant interposed between the pad and the insulating undercoat.

Another embodiment includes a reduced capacitance magnetic head 600 having a contact pad, a substrate, a conducting layer, a low dielectric material, and a conducting stud. Detailed Description, page 10, lines 5-14. The electrical contact pad 610 (See Fig. 6, Specification page 10, lines 5-8) represents one example of the electrical contact pad recited in Claim 16. The substrate 614 (See Fig. 6, Specification page 10, lines 9-13) represents one example of the substrate recited in Claim 16. The insulating undercoat 608 (See Fig. 6, Specification page 10, lines 15-25) represents one example of the insulating layer recited in Claim 16. The low dielectric material 602 (See Fig. 6, Specification page 10, line 26- page 11, line 8) represents one example of the low dielectric material recited in Claim 16. The stud 604 (See Fig. 6, Specification page 10, line 26- page 11, line 8) represents one example of the conducting stud recited in Claim 16.

The following quotation of Claim 16 includes reference numerals and parenthetical references to representative examples of the elements and components recited in Claim 16 in compliance with 37 CFR 41.37(c)(1)(v).

16. A reduced capacitance magnetic head (See Fig. 6, element 600, Specification page 10, lines 1-2) comprising:
an electrical contact pad (See Fig. 6, element 610, Specification page 10, lines 5-9);
a substrate (See Fig. 6, element 614, Specification page 10, lines 15-19) on which the magnetic head is formed;
an insulating layer (See Fig. 6, element 608, Specification page 10, lines 23-25) formed over the substrate;
a low dielectric material (See Fig. 6, element 602, Specification page 10, line 26-page 11, line 8) interposed between the pad and the substrate which is used as a platform for the electrical contact pad to increase the distance between the substrate and the electrical contact pad, the low dielectric material comprising hard bake photo resist (See Fig. 6, Specification page 10, lines 8-9, page 11, lines 8-12) and having a thickness of about 20 μm and a dielectric constant of about 3; and
a conducting stud (See Fig. 6, element 604, Specification page 10, lines 9-14) formed through the low dielectric material to make electrical connection between the electrical contact pad and the insulating layer.

Another embodiment includes a disk drive system that includes a reduced capacitance magnetic head 600 having a contact pad, a substrate, a low dielectric material, a magnetic recording disk, a spin-valve sensor, and a detector. Detailed Description, page 7, lines 2-6, page 10, lines 5-14. The electrical contact pad 610 (See Fig. 6, Specification page 10, lines 5-8)

represents one example of the electrical contact pad recited in Claim 17. The substrate 614 (See Fig. 6, Specification page 10, lines 9-13) represents one example of the substrate recited in Claim 17. The insulating undercoat 608 (See Fig. 6, Specification page 10, lines 15-25) represents one example of the insulating layer recited in Claim 17. The low dielectric material 602 (See Fig. 6, Specification page 10, line 26- page 11, line 8) represents one example of the low dielectric material recited in Claim 17. The magnetic recording disk 104 (See Fig. 1, Specification page 7, lines 2-4) represents one example of the magnetic recording disk. The spin-valve sensor, actuator, and detector are known in the art.

The following quotation of Claim 17 includes reference numerals and parenthetical references to representative examples of the elements and components recited in Claim 17 in compliance with 37 CFR 41.37(c)(1)(v).

> 17. A disk drive system comprising a reduced capacitance magnetic head (See Fig. 6, element 600, Specification page 10, lines 1-2) comprising:
>
> an electrical contact pad (See Fig. 6, element 610, Specification page 10, lines 5-9);
>
> a substrate (See Fig. 6, element 614, Specification page 10, lines 15-19) on which the magnetic head is formed;
>
> an insulating undercoat (See Fig. 6, element 608, Specification page 10, lines 23-25) interposed between the pad and the substrate;
>
> a material (See Fig. 6, element 602, Specification page 10, line 26- page 11, line 8) selected to have a low dielectric constant interposed between the pad and the insulating undercoat;
>
> a magnetic recording disk (See Fig. 1, element 104, Specification page 7, lines 2-4);
>
> a spin-valve sensor for reading data recorded on the recording disk; and
>
> an actuator for moving the spin valve sensor across the magnetic recording disk in order for the spin-valve sensor to access different magnetically recorded data on the magnetic recording disk; and
>
> a detector electrically coupled to the spin-valve sensor and configured to detect changes in resistance of the sensor caused by rotation of the magnetization of the sensing layer relative to the fixed magnetizations of the pinned layer in response to changing magnetic fields induced by the magnetically recorded data.

Another embodiment includes a magnetic head 600 having a contact pad 610 of a reduced size. The reduced surface area of the contact pad 610 minimizes the parasitic capacitance between the substrate 614 and the contact pad 610. Detailed Description, page 10, lines 5-14. In particular, Claim 22 recites a substrate and a contact pad of reduced surface area. The substrate

614 (See Fig. 6, Specification page 10, lines 9-14) represents one example of the substrate recited in Claim 22. The electrical contact pad 610 (See Fig. 6, Specification page 10, lines 5-8) represents one example of the electrical contact pad recited in Claim 22.

The following quotation of Claim 22 includes reference numerals and parenthetical references to representative examples of the elements and components recited in Claim 22 in compliance with 37 CFR 41.37(c)(1)(v).

22. A reduced capacitance magnetic head (See Fig. 6, element 600, Specification page 10, lines 1-2) comprising:

a substrate (See Fig. 6, element 614, Specification page 10, lines 15-19) on which the magnetic head is formed;

an contact pad (See Fig. 6, element 610, Specification page 10, lines 5-9) disposed above the substrate and having a surface area of less than about 20 μm in order to reduce capacitance coupling with the substrate.

Another embodiment includes a magnetic head 600 having a substrate, an alumina undercoat layer, a contact pad, and a layer of alumina between the electrical contact pad and the alumina undercoat layer. Detailed Description, page 10, lines 5-14. The substrate 614 (See Fig. 6, Specification page 10, lines 9-14) represents one example of the substrate recited in Claim 23. The undercoat 608 (See Fig. 6, Specification page 10, lines 15-25) represents one example of the alumina undercoat layer recited in Claim 23. The layer of alumina interposed between the electrical contact pad and the alumina undercoat layer recite in Claim 23 represent one example of "a manner of achieving a greater separation between the contact pads 610 and the substrate material 614..." (See Fig. 6, Specification page 10, lines 17-18).

The following quotation of Claim 23 includes reference numerals and parenthetical references to representative examples of the elements and components recited in Claim 23 in compliance with 37 CFR 41.37(c)(1)(v).

23. A magnetic head (See Fig. 6, element 600, Specification page 10, lines 1-2) comprising:

a substrate (See Fig. 6, element 614, Specification page 10, lines 15-19) on which the magnetic head is formed;

an alumina undercoat layer comprising Al_2O_3 formed over the substrate;

an electrical contact pad (See Fig. 6, element 610, Specification page 10, lines 5-9); and

a layer of alumina interposed between the electrical contact pad and the alumina undercoat layer.

Another embodiment includes a magnetic head 600 having a contact pad 610 that is separated from the substrate 614 by an insulating undercoat 608 of increased thickness. Detailed Description, page 10, lines 15-22. In particular, Claim 24 recites a substrate, an insulating undercoat layer, an electrical contact pad, and another layer of SiO2. The substrate 614 (See Fig. 6, Specification page 10, lines 9-14) represents one embodiment of the substrate recited in Claim 24. The insulating undercoat 608 (See Fig. 6, Specification page 10, lines 15-25) represents one example of the insulating undercoat layer and the additional layer of SiO2 recited in Claim 24. The electrical contact pad 610 (See Fig. 6, Specification page 10, lines 5-8) represents one example of the electrical contact pad recited in Claim 24.

The following quotation of Claim 24 includes reference numerals and parenthetical references to representative examples of the elements and components recited in Claim 24 in compliance with 37 CFR 41.37(c)(1)(v).

24. A magnetic head (See Fig. 6, element 600, Specification page 10, lines 1-2) comprising:

a substrate (See Fig. 6, element 614, Specification page 10, lines 15-19) on which the magnetic head is formed;

an alumina undercoat layer comprising SiO_2 formed over the substrate;

an electrical contact pad (See Fig. 6, element 610, Specification page 10, lines 5-9); and

a layer of alumina interposed between the electrical contact pad and the alumina undercoat layer.

Another embodiment includes a method of reducing capacitance in a magnetic head 600 by isolating the read/write head from the substrate to reduce capacitance coupling. Detailed Description, page 10, lines 15-22. In particular, Claim 25 recites providing a substrate and a read/write head and isolating the read/write head from the substrate to reduce capacitance coupling. The substrate 614 (See Fig. 6, Specification page 10, lines 9-14) represents one example of a substrate provided in Claim 25. The read contact layers 218 and write contact layers 206 (See Fig. 6, Specification page 7, lines 19-24) represents one example of the read/write head recited in Claim 25. The insulating undercoat 608 (See Fig. 6, Specification page 10, lines 15-25) represents one example of isolating the read/write head from the substrate recited in Claim 25.

The following quotation of Claim 25 includes reference numerals and parenthetical references to representative examples of the elements and components recited in Claim 25 in compliance with 37 CFR 41.37(c)(1)(v).

25. A method for reducing capacitance in a magnetic head, (See Fig. 6, element 600, Specification page 10, lines 1-2) comprising:

providing a substrate (See Fig. 6, element 614, Specification page 10, lines 15-19);

providing a read/write head (See Fig. 6, elements 218 and 206 Specification page 7, lines 19-24); and

isolating (See Fig. 6, element 206 Specification page 10, lines 15-25) the read/write head from the substrate in order to reduce the capacitance coupling between the read head and the substrate.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Issue I is addressed in the Appellant's Appeal Brief of February 22, 2005 and incorporated by reference. Issues II and III address the new rejections raised in the new Final Office Action.

I. Whether the Examiner failed to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a) for Claims 1-25 where the limitations of the claims are not taught within the combination of cited references?

II. Whether the Examiner failed to establish a *prima facie* case of anticipation under 35 U.S.C. § 102(b) for claims 1-3, 5-7, 14, 16, and 23-25 where the limitations of the claims are not taught by the cited reference?

III. Whether the Examiner failed to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a) for claims 4, 8-13, 15, and 17-22 where the limitations of the claims are not taught or suggested within the combination of cited references?

7. ARGUMENT

I. The Examiner failed to establish a *prima facie* case of obviousness because the cited references, either alone or in combination, do not teach or suggest all of the limitations of Claims 1-25.

The corresponding part of the Appeal Brief of February 22, 2005, to the extent it may be applicable, is incorporated by reference.

II. The Examiner failed to establish a *prima facie* case of anticipation under 35 U.S.C. § 102(b) for Claims 1-3, 5-7, 14, 16, and 23-25 where the limitations of the claims are not taught by the cited reference.

Appellants respectfully assert that Huai fails to teach all the elements of independent Claims 1, 16, 23, 24, and 25. Specifically, Huai fails to teach the electrical contact pad recited in the claims. Furthermore, even if *arguendo* Huai did explicitly or inherently disclose an electrical contact pad, Huai fails to teach the insulating undercoat and low dielectric material positioned, relative to the electrical contact pad, as recited in the claims.

A. The Electrical Contact Pad

Embodiments and representations of the electrical contact pads are shown in Figures 2 (items 206 and 218), 5 (items 502), and 6 (items 606 and 610) of the present application. These read/write contact pads provide locations at which electrical leads may be connected at the read/write head. This exemplary connectivity function is depicted in Figure 5, which represents the contact pads 502 as connection points for the various lead wires (not shown), e.g. W+, W-, R+, and R-. Furthermore, Figures 2, 5, and 6 each depict the contact pads as being separate from the magnetoresistive (MR) coil. These contact pads are particularly distinct from any electrical windings within the MR coil.

The Office Action states that Huai discloses an electrical pad 36, but this mischaracterizes the Huai disclosure. Item 36 of Huai is an electrical feedthrough that connects the lower and upper inductive coils 32A, 32B together. Huai, Fig. 5; col. 4, lines 12-17. Therefore, the electrical feedthrough 36 is an intrinsic part of the coil structure, providing a serial connection

between the lower and upper coils 32A, 32B. In fact, the electrical feedthrough is nothing more than a part of the two coil layers 32A, 32B.

As described in Huai, the lower coils 32A, including the lower portion of the electrical feedthrough 36, are formed during the electroplating process shown in Figure 6L. Subsequently, the upper coils 32B, including the upper portion of the electrical feedthrough 36, are formed during a substantially similar electroplating process shown in Figure 6O. The upper portion of the electrical feedthrough 36 is physically deposited on the lower portion of the electrical feedthrough 36 via the feedthrough 62 void shown in Figure 6N. See, Huai, col. 5, lines 40-67. Therefore, it is clear that the electrical feedthrough 36 is not anticipatory of the electrical contact pad of the present application because it is an integral part of the coil structure and does not function to connect lead wires to the MR head. Rather, the electrical feedthrough 36 simply connects the lower coils 32A to the upper coils 32B. See Huai, col. 5, lines 59-62.

B. The Insulating Undercoat

The Office Action states that Huai discloses an insulating alumina undercoat 56, but this also mischaracterizes the Huai disclosure. Item 56 of Huai is only described as a protective layer. Huai, col. 5, lines 23-30. While Huai does explain that a slurry of alumina or silicon dioxide may be used for gross removal of excess protective layer material, Huai does not disclose the composition of the protective material itself. In other words, Huai describes a protective material 56 and a separate slurry that may be used to conduct preliminary leveling of the protective layer before fine leveling by ion milling. The alumina slurry, however, is distinct from the protective material 56, which has an undisclosed composition. Therefore, the protective material 56 does not anticipate the insulating undercoat of the present application because its composition and insulating properties, if any, are undisclosed. Furthermore, Huai fails to teach or disclose that the layer 56 is "interposed between the pad and the substrate" as recited in Claim 1. As explained above, item 36 is not a contact pad. Instead, the electrical feedthrough 36 is an intrinsic part of the coil structure.

C. The Low Dielectric Material

The Office Action states that Huai discloses a material 60 & 66 selected to have a low dielectric constant interposed between the pad 36 and the insulating alumina undercoat 56. As described above, the Office Action's references to a "pad 36" and an "insulating alumina

undercoat 56" are not supported by Huai. Nevertheless, even if *arguendo* the electrical feedthrough 36 were a contact pad and the protective layer 56 were an insulating undercoat, Huai still fails to disclose a low dielectric material interposed between the electrical feedthrough 36 and the protective layer 56.

Rather, Huai specifically discloses the opposite configuration—Huai describes and shows the electrical feedthrough 36 interposed between the dielectric material 66 and the protective layer 56. See Huai Figures 5 and 6S. The dielectric layer 60 is on the side of the electrical feedthrough 36, also interposed between the dielectric material 66 and the protective layer 56. Appellant notes that Figure 6S illustrates the feedthrough 36 using two layers of cross-hatch to explain the manufacturing process, but together these layers form the feedthrough 36. There is no way to accurately describe the configuration shown in Figure 5 of Huai to support the Office Action's assertion that either of the dielectric materials 60, 66 is interposed between the electrical feedthrough 36 and the protective layer 56 because the electrical feedthrough 36 and protective layer 56 are immediately adjacent to one another. See Huai Figure 6S. Therefore, the dielectric materials 60, 66 do not anticipate the low dielectric material interposed between the pad and the substrate.

For the reasons stated above, Huai fails to teach all of the elements recited in the independent Claims 1, 16, 23, 24, and 25. In particular, Huai fails to teach the recited electrical contact pad, the insulating undercoat, and the low dielectric material. Accordingly, the Office Action fails to establish a *prima facie* case of anticipation because the cited reference fails to teach every element of these claims. Given that the cited reference fails to teach all of the elements recited in Claims 1, 16, 23, 24, and 25, Applicant respectfully submits that independent Claims 1, 16, 23, 24, and 25 are patentable over the cited reference. Consequently, Applicant requests that the rejection of Claims 1, 16, 23, 24, and 25 under 35 U.S.C. § 102(b) be withdrawn.

Given that dependent Claims 2-15 depend from Claim 1, Applicant respectfully submits that Claims 2-15 are also patentable over the cited reference. Accordingly, Applicant requests that the rejection of dependent Claims 2-3, 5-7, and 14 under 35 U.S.C. § 102(b) be withdrawn. Furthermore, Applicant requests that the rejection of dependent Claims 4, 8-13, and 15 under 35 U.S.C. § 103(a) also be withdrawn.

III. The Examiner failed to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a) for Claims 4, 8-13, 15, and 17-22 where the limitations of the claims are not taught or suggested within the combination of cited references.

Appellants respectfully assert that Huai fails to teach or suggest all the elements of independent Claims 17 and 22. Specifically, as explained above, Huai fails to teach or suggest the electrical contact pad recited in the claims. Furthermore, even if *arguendo* Huai explicitly or inherently discloses an electrical contact pad, Huai fails to teach or suggest the low dielectric material interposed between the electrical contact pad and the substrate, as recited in Claim 17. Furthermore, Huai fails to teach or suggest a surface area characteristic of the electrical contact pad, as recited in Claim 22.

As described above, with regard to the rejections under 35 U.S.C. § 102(b), Huai fails to teach an electrical contact pad or a low dielectric material, as recited in Claim 17. Specifically, the electrical feedthrough 36 of Huai does not anticipate the electrical contact pad of the present application. Furthermore, the dielectric materials 60, 66 do not anticipate the low dielectric material of the present invention.

With regard to the surface area of the electrical contact pad recited in Claims 15 and 22, the Office Action completely fails to provide any support for the assertion of obviousness. Even if *arguendo* the electrical feedthrough 36 of Huai were an electronic contact pad, as recited in the Claims, Huai still does not make obvious the surface area of the electrical feedthrough 36. In fact, Huai is silent as to the surface area of the electrical feedthrough 36 and provides absolutely no particular guidance as to the design, shape, or dimensions of the electrical feedthrough 36.

Moreover, the Office Action fails to provide any motivation to modify the electrical feedthrough 36 of Huai to have a particular surface area. The Office Action only states that modifying the electrical feedthrough 36 so that it has a surface area of less than 20 μm would "optimize the electrical properties of the [electrical feedthrough 36] and decrease any unwanted interference." This motivation is not present in Huai.

The Examiner appears to improperly take Official Notice of this assertion, but fails to comply with the requirements for Official Notice. Specifically, the assertion is not shown to be

well-known or common knowledge in the art and the brief, conclusory statement fails to provide a clear and unmistakable technical line of reasoning, as required by MPEP § 2144.04. If the Examiner maintains this assertion, Applicant requests that the Examiner provide evidence to show that modifying the electrical feedthrough 36 of Huai to have a surface area of less than 20 μm would in fact "optimize the electrical properties of the [electrical feedthrough 36] and decrease any unwanted interference." Without the proper evidentiary support for this conclusory assertion, the Examiner is understood to have improperly relied on impermissible hindsight to produce an otherwise unsupported motivation to modify the cited reference.

For the reasons stated above, Huai fails to teach or suggest all of the elements recited in the independent Claims 17 and 22. In particular, Huai fails to teach or suggest the recited electrical contact pad and the low dielectric material. Huai also fails to teach or suggest the surface area characteristic of the electrical contact pad. The Examiner also fails to show adequate motivation to modify Huai.

Accordingly, the Office Action fails to establish a *prima facie* case of obviousness because the cited reference fails to teach every element of these claims or show a suggestion or motivation to modify the cited reference. Given that the cited reference fails to teach all of the elements recited in Claims 17 and 22, Applicant respectfully submits that independent Claims 17 and 22 are patentable over the cited reference. Consequently, Applicant requests that the rejection of Claims 17 and 22 under 35 U.S.C. § 103(a) be withdrawn.

Given that dependent Claims 18-21 depend from Claim 17, Applicant respectfully submits that Claims 18-21 are also patentable over the cited reference. Accordingly, Applicant requests that the rejection of dependent Claims 18-21 under 35 U.S.C. § 103(a) be withdrawn.

SUMMARY

In view of the foregoing, each of the claims on appeal has been improperly rejected because the Examiner has not properly established a *prima facie* case of anticipation or a *prima facie* case of obviousness for Claims 1-25. Appellants submit that the foregoing arguments establish the novelty and non-obviousness of the claims over the cited reference. Therefore, Appellants respectfully request reversal of the Examiner's rejections under 35 U.S.C. §§ 102(b) and 103(a). Furthermore, Appellants request allowance of pending Claims 1-25.

Respectfully submitted,

Date: November 17, 2006

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8. CLAIM APPENDIX

The claims involved in the appeal, namely Claims 1-25, are listed below.

1. A magnetic head comprising:

an electrical contact pad;

a substrate on which the magnetic head is formed;

an insulating undercoat interposed between the pad and the substrate; and

a material selected to have a low dielectric constant interposed between the pad and the insulating undercoat.

2. The magnetic head of claim 1, wherein the low dielectric material is configured to decrease the parasitic capacitance of the magnetic head.

3. The magnetic head of claim 1, further comprising a stud formed through the low dielectric material.

4. The magnetic head of claim 3, wherein the stud comprises Cu.

5. The magnetic head of claim 3, wherein the stud comprises a conductive material.

6. The magnetic head of claim 1, wherein the low dielectric material comprises hard-bake photo resist.

7. The magnetic head of claim 1, wherein the low dielectric material comprises SiO_2.

8. The magnetic head of claim 1, wherein the low dielectric material has a thickness in a range of between about 1 μm and about 100 μm.

9. The magnetic head of claim 1, wherein the low dielectric material has a thickness in a range of between about 10 μm and about 50 μm.

10. The magnetic head of claim 1, wherein the low dielectric material has a thickness of about 20 μm.

11. The magnetic head of claim 1, wherein the low dielectric material has a dielectric constant of less than about 9.

12. The magnetic head of claim 1, wherein the low dielectric material has a dielectric constant of about 3.

13. The magnetic head of claim 1, wherein the magnetic head carries a GMR sensor.

14. The magnetic head of claim 1, wherein the low dielectric material provides a platform for the electrical contact pad.

15. The magnetic head of claim 1, Further comprising an electrical contact pad having a surface area of less than about 20 μm in order to reduce capacitance coupling with the substrate.

16. A reduced capacitance magnetic head comprising:

an electrical contact pad;

a substrate on which the magnetic head is formed;

an insulating layer formed over the substrate;

a low dielectric material interposed between the pad and the substrate which is used as a platform for the electrical contact pad to increase the distance between the substrate and the electrical contact pad, the low dielectric material comprising hard bake photo resist and having a thickness of about 20 μm and a dielectric constant of about 3; and

a conducting stud formed through the low dielectric material to make electrical connection between the electrical contact pad and the insulating layer.

17. A disk drive system, comprising:

a reduced capacitance magnetic head comprising:

an electrical contact pad;

a substrate on which the magnetic head is formed;

an insulating undercoat interposed between the pad and the substrate;

a material selected to have a low dielectric constant interposed between the pad and the insulating undercoat; and

a magnetic recording disk;

a spin-valve sensor for reading data recorded on the recording disk; and

an actuator for moving the spin valve sensor across the magnetic recording disk in order for the spin-valve sensor to access different magnetically recorded data on the magnetic recording disk; and

a detector electrically coupled to the spin-valve sensor and configured to detect changes in resistance of the sensor caused by rotation of the magnetization of the sensing layer relative to the fixed magnetizations of the pinned layer in response to changing magnetic fields induced by the magnetically recorded data.

18. The disk drive system of claim 17, further comprising a stud formed through the low dielectric material.

19. The disk drive system of claim 17, wherein the low dielectric material is configured to decrease the parasitic capacitance of the magnetic head.

20. The disk drive system of claim 17, wherein the low dielectric material has a thickness in a range of between about 10 μm and about 50 μm.

21. The disk drive system of claim 17, wherein the magnetic head comprises a GMR sensor.

22. A reduced capacitance magnetic head comprising:

a substrate on which the magnetic head is formed; and

a contact pad disposed above the substrate and having a surface area less than about 20 μm in order to reduce capacitance coupling with the substrate.

23. A magnetic head comprising:

a substrate on which the magnetic head is formed;

an alumina undercoat layer comprising Al_2O_3 formed over the substrate;

an electrical contact pad; and

a layer of alumina interposed between the electrical contact pad and the alumina undercoat layer.

24. A magnetic head comprising:

a substrate on which the magnetic head is formed;

an insulating undercoat layer comprising SiO2 formed over the substrate;

an electrical contact pad; and

a layer of SiO2 interposed between the electrical contact pad and the insulating undercoat layer.

25. A method of reducing capacitance in a magnetic head, comprising:

providing a substrate;

providing an insulating layer directly over the substrate;

providing a read/write head; and

providing a material selected to have a low dielectric constant between the pad and the insulating layer for isolating the read/write head from the substrate in order to reduce the capacitance coupling between the read head and the substrate.

9. EVIDENCE APPENDIX

There is no material to be included in the Evidence Appendix.

10. RELATED PROCEEDINGS APPENDIX

There is no material to be included in the Related Proceedings Appendix.